

ABSTRACT OF THE DISCLOSURE

The disclosure provides a nanodelivery system and related process having complex, multilayered nanoparticles for sophisticated drug/gene delivery systems to intracellular portions of a cell. Outermost layers can include cell targeting and cell-entry facilitating molecules. The next layer can include intracellular targeting molecules for precise delivery of the nanoparticle complex inside the cell of interest. Molecular biosensors can be used to confirm the presence of expected molecules as a surrogate molecule for signs of infection, for activation in radiation damage, or other criteria, prior to delivery of counter-measure molecules such as drugs or gene therapy. The biosensors can also be used as a feedback control mechanism to control the proper amount of drug/gene delivery for each cell. Further, the nanodelivery system can be used to restrict any cells from encountering the drug unless that cell is specifically targeted. Successful targeting can be verified by 3D multispectral confocal microscopy.